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(54) Abstract Title

**Pyramid Drainage Bag**

(57) A drainage bag for liquids 10 has a pyramid configuration and is used for hygiene or medical purposes, such as urine collection. The shape of the bag allows it to be stabilized by the weight of its contents. An inlet 24 and outlet 30 may be located along seams adjacent to corners 25, 32 of the bag. The outlet may be in the form of a tap 30 comprising a housing 34 and a slidable tap member 36. The inlet 24 may have a non-return valve 26 which obstructs the flow of liquid out through tube 24. The non-return valve consists of a flat ended flue 28. The bag is formed by first forming a rectangular pouch (fig. 3) with an opening at one end. First and second edge portions (70, 72, fig. 3) are then pulled apart and upper and lower ends (66, 68, fig.3) are pulled together and a seam is welded to form the pyramid container 10.

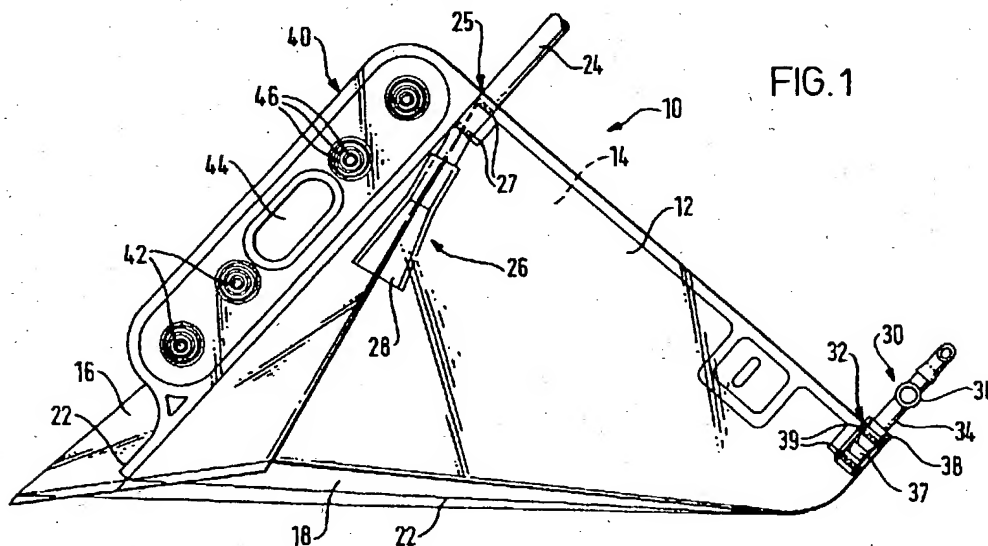
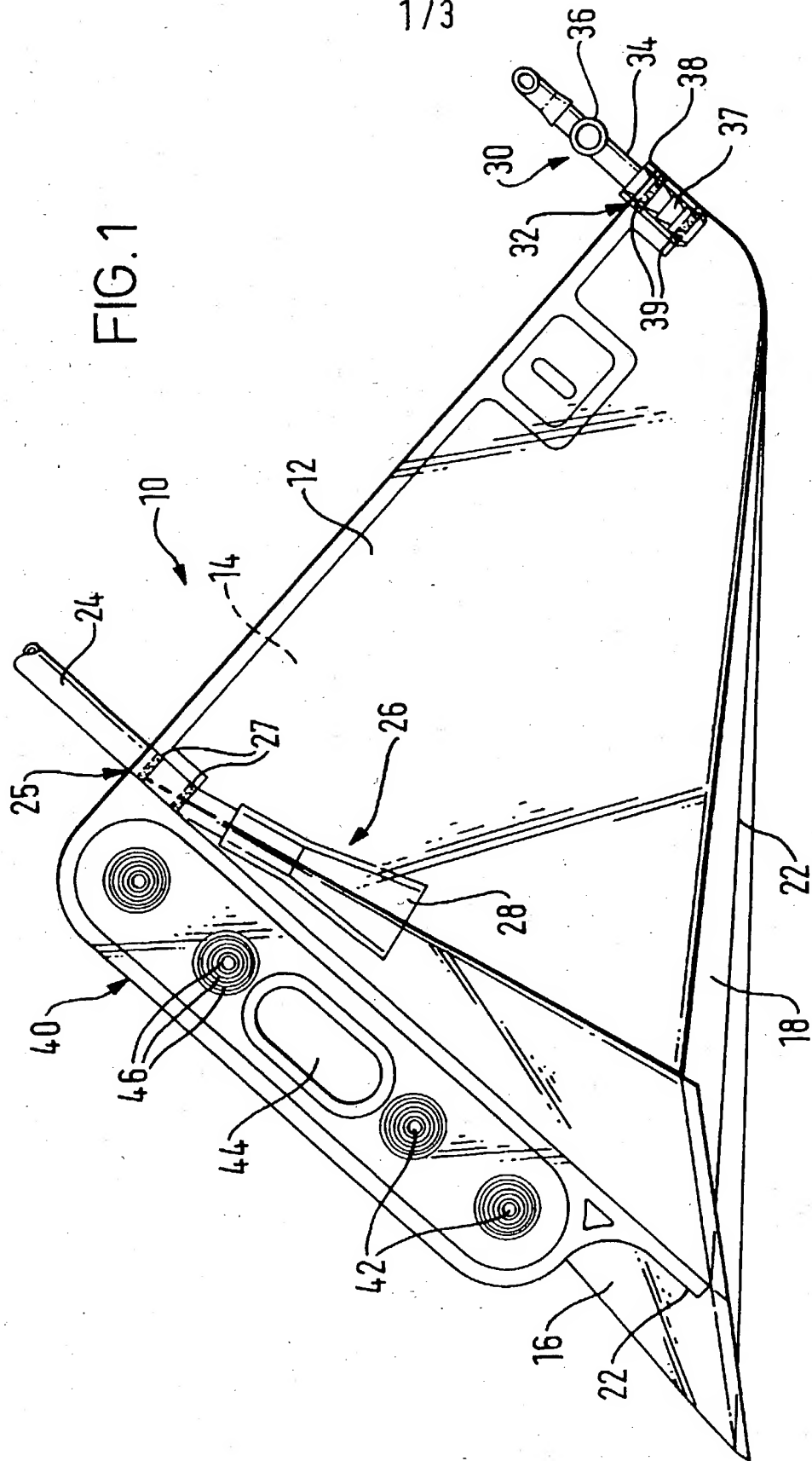


FIG.1

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FIG. 1



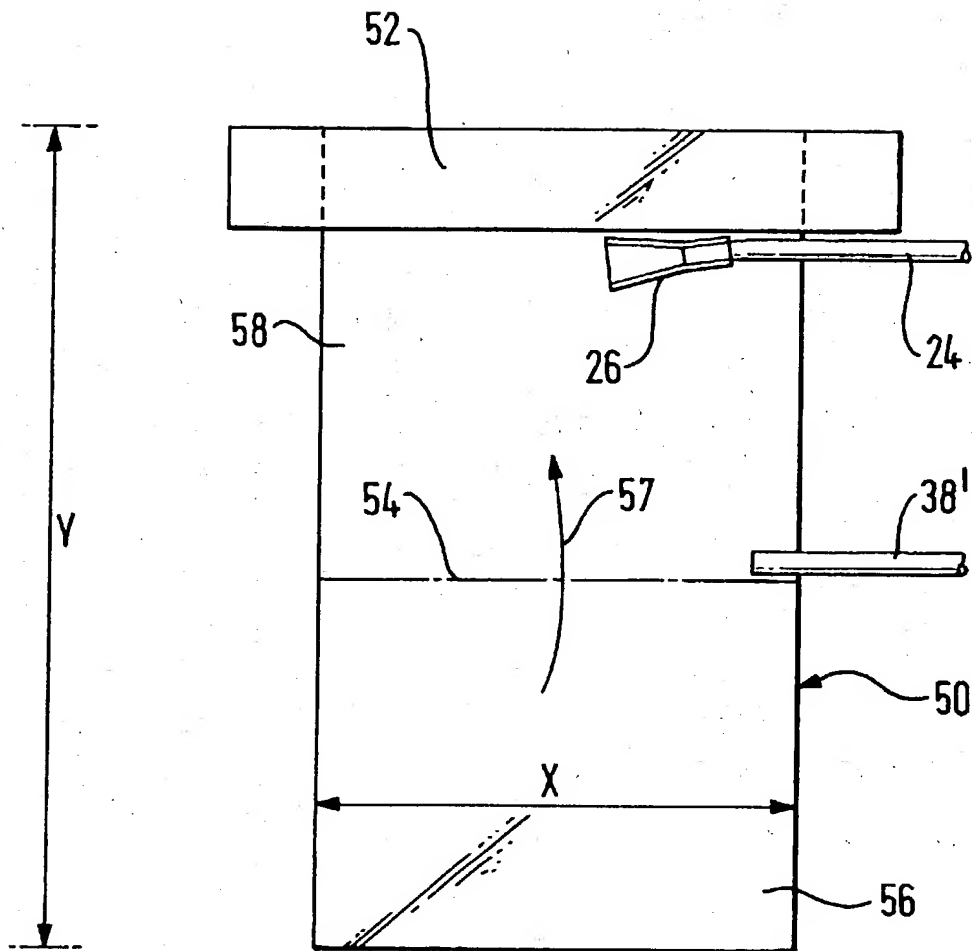


FIG. 2

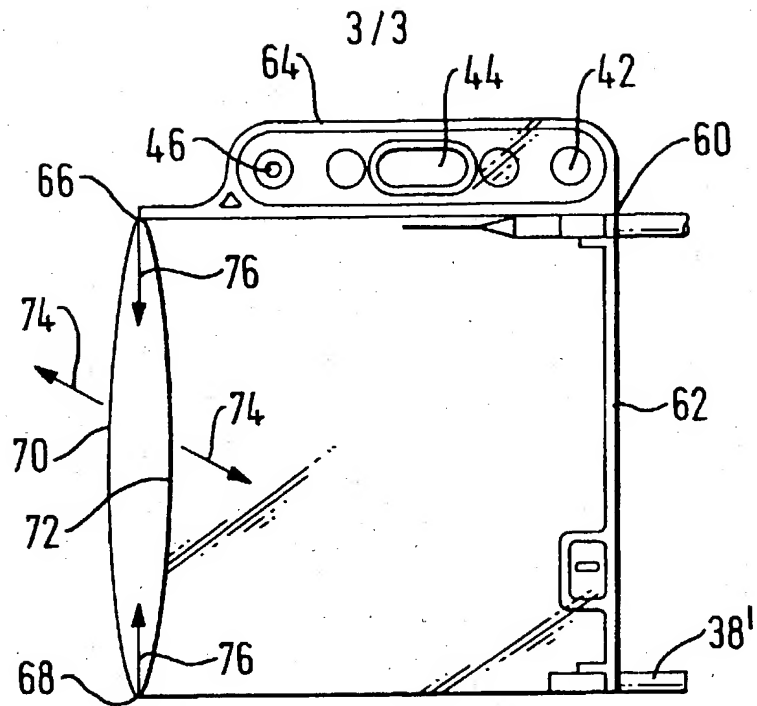


FIG. 3

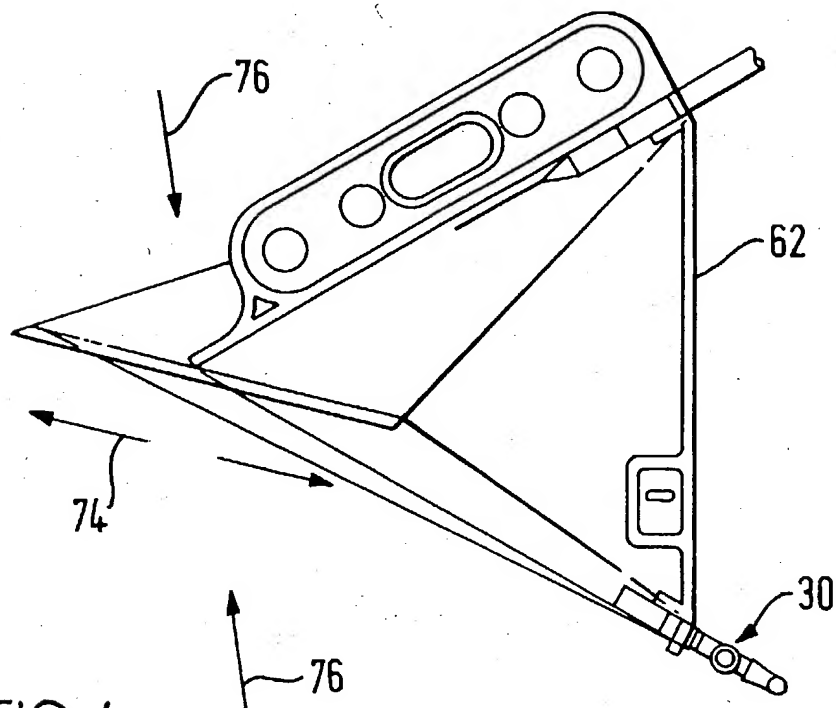


FIG. 4

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DRAINAGE BAG

This invention relates to a drainage bag, particularly for hygiene or medical use. The invention is particularly concerned with such bags which are not worn on a person's body. In one aspect, the invention relates to a urine collection bag for  
5 collecting urine from a catheter or incontinence appliance. Such bags are commonly used in hospitals, or as overnight bags for personal use.

Many designs of urine collection bag are known. A common design consists of two sheets of rectangular flexible plastics film welded together around their edges to  
10 form a generally rectangular pouch. A inlet tube or connector, and an outlet tap, are positioned within the weld seam to be sealed in position by the peripheral weld. In use, the pouch is hung on a suitable stand to allow the pouch to inflate as it collects urine.

Reference is also made to GB-A-2109770 (Craig Medical Products Limited) which discloses a urine collection bag which employs a rigid wall of liquid  
15 impermeable material. The bag is self supporting without the need for a stand. This design can provide many advantages in terms of flexibility of use, and convenience for the user. However, the presence of the stiff wall prevents the bag from being folded into an optimum small size for packaging, transportation and disposal after use.

20 The present invention has been devised bearing the above problems in mind.

In contrast to the prior art techniques, one aspect of the present invention is to employ a pyramidal bag structure.

It has been discovered that such a structure can be made to be erectable, or self-supporting, even when the bag is made substantially entirely of flexible or pliant  
25 material (or at least the erectable portion of the bag is made substantially entirely of such material).

For example, a suitable material is polyvinylchloride (PVC). The sheet may typically be about 200 microns thick.

If desired, the bag may include a stiffener, but it is preferred that the stiffener does not constitute an entire wall of the bag. In a preferred form the stiffener is  
5 positioned in a peripheral seam of the bag from which the bag may be hung. The stiffener serves to support the bag along the respective seam edge.

Preferably, the bag comprises an outlet at, or adjacent to, one corner of the pyramid shape. This enables the bag to be completely drained when desired. The bag can be orientated such that the outlet is at the lowest point of the bag, thus ensuring that  
10 no liquid is trapped in the bag. The outlet may, for example, include a tap unit. The outlet is preferably sealed within a peripheral weld seam of the bag.

Preferably, the bag further comprises an inlet entering the bag at another corner of the pyramid shape. Preferably, the inlet includes a non-return valve for preventing, or at least obstructing, reverse flow of liquid out of the bag through the inlet.

15 In another aspect, the invention provides a method of producing a pyramid-style collection bag, comprising securing edges of one or more sheets of liquid impermeable flexible plastics material to define a pouch having an open mouth defined by first and second edge portions of the sheet or sheets, drawing the opposite ends of the mouth together to define a pyramid-style shape, and securing the confronting portions of the  
20 first edge portion, and of the second edge portion.

Preferably, the pouch (with the open mouth) is made in a generally flat configuration. This can avoid having to form, and to handle, a complicated three dimensional shape until the pyramid shape is formed.

Preferably, the edges of the sheet or sheets are secured by welding, for  
25 example, by radio frequency (R.F.) welding.

An embodiment of the invention is now described by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view from the side of a urine collection bag;

Fig. 2 is a schematic illustration of a first stage in the production of the bag;

Fig. 3 is a schematic illustration of a second production stage; and

Fig. 4 is a schematic illustration of a third production stage.

5 Referring to Fig. 1, a urine collection bag 10 consists of a first side panel 12, a second side panel 14, a third side panel 16 and a floor panel 18 defining a triangular pyramid shape. The references to side and floor panels are not limiting, but merely refer to the orientation of the bag as shown in Fig. 1. The third side panel 16 and the floor 18 are each divided into two halves by a weld seam 22.

10 In this embodiment, the bag is made of transparent PVC sheet material, approximately 200 microns thick.

The bag has an inlet tube 24 which enters the bag at its upper corner 25 (i.e. the corner 25 at which the side panels meet) through a weld seam of the bag. The inlet tube is sealed within the seam by two annular welds 27. The tube 24 terminates inside 15 the bag 10 with a non-return valve 26 which functions to prevent, or at least obstruct, urine flow flowing out of the bag 10 through the tube 24. In this embodiment, the non-return valve 26 consists a flat ended flue 28 defined by two thin sheets of plastics welded around the end of the tube 24. The sheets lie closely adjacent to each other at the mouth of the flue to provide the non-return effect. Urine dripping in through the 20 tube is able to dribble through the flue 28, but urine will not readily re-enter the flat end of the flue 28. In this embodiment, the inlet tube 24 and the flue sheets are of PVC.

The bag 10 also has an outlet tap 30 which exits the bag at a lower corner 32 (i.e. a corner 32 at which two of the side panels meet the floor panel). Various types 25 of tap 30 are suitable; in this embodiment, the tap consists of a housing 34 with a longitudinal fluid bore and a transverse bore for receiving a slidable tap member 36. The inner end of the tap consists of a barbed spigot 37 which, as explained further



below, is seated in a short PVC tube 38 which passes through, and is sealed in, a peripheral weld seam of the bag 10 by two annular welds 39.

A feature of this design of bag is that, although the PVC sheet material is fully flexible, the bag 10 is self-supporting and can be erected without requiring a stand. This enables the bag 10 to be placed on, for example, the floor and to be inflated as the urine is collected. Before and after use, the bag 10 is fully collapsible, enabling it to be folded into a compact form for packing, for transportation and for disposal.

In the present embodiment, a projecting, slightly stiffer, flange 40 is provided along one corner edge of the bag 10. The flange is provided with a plurality of circular openings 42 to enable the bag 10 to be hung (for example on a stand if desired), and with an elongate finger slot 44 enabling the bag 10 easily to be carried. The circular openings 42 are each reinforced by a plurality of weld lines 46 to provide increased resistance to tearing when the bag is hung on a hook. The stiffener is formed by a further sheet of PVC material welded to a peripheral flange of the bag. The further sheet is thicker than the bag sheet thickness and may, for example, be about 400 microns thick.

In the present embodiment, each face of the bag 10 has a generally equilateral triangle shape. The edge dimension may typically be about 25 cm.

A preferred method of producing the bag 10 is illustrated in Figs. 2 to 4. In the following description, references to left, right, upper and lower, etc. are not limiting but refer merely to the orientation illustrated in the drawings.

Referring firstly to Fig. 2, the main erectable portion of the bag 10 is formed from a single generally rectangular sheet 50 of PVC plastics material about 200 microns thick. The dimension X is about 25 cm, and the dimension Y is about 60 cm. A second piece 52 of PVC stiffener material about 400 microns thick is placed to overlap one edge of the sheet 50. The inlet tube 24 carrying the non-return valve 26 is positioned adjacent to the stiffener material 52, and a second PVC tube 38' is placed

adjacent to a notional fold line 54 about which the sheet will be folded as described below. The second PVC tube 38' will later form the seat tube 38 for the outlet tap described above, but during production is a long tube for ease of handling.

Referring to Figs. 2 and 3, the lower portion 56 of the sheet 50 is folded  
 5 upwardly about the fold line 54 (as indicated by arrow 57) to be superimposed on the upper portion 58 of the sheet, and is secured by welding along an upper edge seam 60 and a right edge seam 62. The stiffener material 52 is also secured to the edge of the main sheet 50 by R.F. welding along a seam 64 which meets the upper edge seam 60, and the reinforcing welds 46 are also made at this time. The stiffener material 52 is  
 10 then punched to form the openings 42 and 44, and is trimmed to the illustrated shape. The inlet tube 24 and the second tube 38' are sealed within the right edge seam 62 by pairs of annular welds.

As can be seen in Fig. 2, the shape formed at this stage corresponds to a generally rectangular pouch which is open along its left side. The open side extends  
 15 between an upper end 66 and a lower end 68, and is defined by first and second edge portions 70 and 72 of the sheet 50.

Referring to Figs. 3 and 4, the pyramid shape is formed by drawing the first and second edge portions 70 and 72 outwardly away from each other (indicated by arrows 74), which thus draws the upper and lower ends 66 and 68 towards each other  
 20 (indicated by arrows 76). The confronting regions of the first edge portion 70, and the confronting regions of the second edge portion 72, are welded to form the final edge of the pyramid bag 10.

To complete the bag 10, the second tube 38' is trimmed down to have a projecting length of about 5 mm to form the seat tube 38, and the barbed spigot of the  
 25 outlet tap 30 is inserted to lock into the seat tube 38.

Preferably, the welding operations are carried out by R.F. welding, for which PVC is suitable.

## CLAIMS

1. A medical or hygiene drainage bag for liquids, the bag having a pyramid configuration.
- 5 2. A bag according to claim 1, wherein the bag is a urine collection bag.
3. A bag according to claim 1 or 2, wherein the bag is capable of self supporting its pyramid shape.
- 10 4. A bag according to claim 1, 2 or 3, wherein the bag comprises an erectable portion made substantially entirely of pliant material.
5. A bag according to any preceding claim, wherein the bag is of plastics material.
- 15 6. A bag according to claim 5, wherein the bag comprises a portion of PVC sheet.
7. A bag according to claim 6, wherein the PVC sheet is about 200 microns thick.
- 20 8. A bag according to any preceding claim comprising an outlet located at, or adjacent to, a corner of the pyramid shape.
9. A bag according to claim 8, wherein the outlet comprises a tube located in a seam of the bag.
- 25 10. A bag according to claim 8 or 9, wherein the outlet comprises a tap.
11. A bag according to any preceding claim, wherein the bag comprises an inlet located at, or adjacent to, a corner of the pyramid shape.
- 30

12. A bag according to claim 11, wherein the inlet comprises a non-return valve.
13. A bag according to claim 12, wherein the non-return valve comprises a flat ended flue.
- 5 14. A bag according to any preceding claim comprising a relatively stiffer region.
15. A bag according to claim 14, wherein the relatively stiff region comprises one or more openings for facilitating supporting the bag from above.
- 10 16. A method of producing a pyramid-style medical or hygiene drainage bag, comprising securing edges of one or more sheets of liquid impermeable flexible plastics material to define a pouch having an open mouth defined by first and second edge portions of the sheet or sheets, drawing the opposite ends of the mouth together to
- 15 17. A method according to claim 16, wherein the steps of securing comprises welding the plastics material.
- 20 18. A method according to claim 17, wherein the welding is R.F. welding.
19. A medical or hygiene drainage bag, or a method of producing such a bag, being substantially as hereinbefore described with reference to any of the accompanying
- 25 20. drawings.